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Geotechnical
Environmental
Water Resources
Engineering

December 4, 2013
Project 04516-3

Bureau of Waste Site Cleanup
Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

Dear Sir or Madam:

Re: Release Abatement Measure Plan
50 Tufts Street
Somerville, Massachusetts
MassDEP RTN 3-23246

On behalf of Sterling Construction & Development LLC of Chelsea, Massachusetts, GEI Consultants, Inc. (GEI) is submitting this Release Abatement Measure (RAM) Plan for response actions associated with the construction of a two-family residential building at 34 Knowlton Street in Somerville, Massachusetts (the Property; Fig. 1 and Fig. 2). Response actions include installation of a vapor barrier and a sub-slab ventilation piping network (piping network) beneath the building, and management of potentially contaminated soil. During construction, appropriate electrical and telephone hookups also will be installed to provide connections to a radon-type fan and remote telemetric system, if needed, based on the results of post-construction confirmatory indoor air testing. The building construction and associated response actions under this RAM Plan are being conducted by Sterling Construction & Development LLC, the current property owner.

The Property is located on a portion of the Massachusetts Department of Environmental Protection (MassDEP)-listed disposal site identified as 50 Tufts Street and assigned Release Tracking Number (RTN) 3-23246 (the Site). This RAM Plan was prepared in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.0440).

The RAM Plan describes how the vapor barrier and piping network will be installed, how potentially contaminated soil will be managed during the construction project, and demonstrates how construction of the building will not significantly impede future investigation and/or remediation at the Property and will not pose an unacceptable risk to construction workers, surrounding populations, and/or future occupants of the building.

The MassDEP RAM Transmittal Form (BWSC106) is being submitted electronically via eDEP, and a copy is in Appendix A. The required public notice letters have been sent to the Chief Municipal Officer and Board of Health for the City of Somerville, and copies are in Appendix B. GEI will provide copies of this RAM Plan to the local public document repositories that were established for the Site at the Somerville Central Public Library and at the City of Somerville Clerk's Office. GEI will also provide an electronic version of this report to the City for posting to the City's web site.

A RAM fee is not required because the Site has been Tier Classified.

1. Contact Information (310 CMR 40.0444[1][a])

Responsibility for the RAM
Richard Arnone
Manager
Sterling Construction &
Development LLC
285 Commandants Way, Suite 12
Chelsea, MA 02150
781-953-7112

Licensed Site Professional (LSP) for the RAM
Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781-721-4012
LSP License No. 9719

2. Description of Release, Site Conditions, and Surrounding Receptors (310 CMR 40.0444[1][b])

2.1 Site Description

A release of chlorinated volatile organic compounds (VOCs) to soil and groundwater on the 50 Tufts Street property was first reported to MassDEP in 2002. Numerous studies have been conducted at the Site, and response actions are currently being conducted as part of Phase V of the MCP process. Chlorinated VOCs generally have not been detected in soil beyond the limits of the 50 Tufts Street property. Chlorinated VOCs have been detected in groundwater beyond the 50 Tufts Street property boundaries. Through studies conducted at the Site, the extent of dissolved concentrations of chlorinated VOCs in groundwater has been determined, and the Site boundary has been delineated. The Property is located within the boundaries of the Site (Fig. 2).

The property is located approximately 350 feet northeast of the 50 Tufts Street property. It is located within a commercial/residential zoning district and fronts residential property to the south and west, Knowlton Street to the east, and the Capuano Early Childhood Center (Capuano Center) to the north. The Property is currently the site of a residential-type garage that had been used for storage. There is no living space in the building and it is not occupied.

2.2 Subsurface Conditions

Subsurface investigations have not been performed at the Property. However, based on two soil borings performed by GEI in the vicinity of the Property (MW112 and MW112A), the Property's stratigraphy is estimated to be as follows:

- Sandy Fill: Sandy fill in this portion of the Site consists of approximately 4 to 6 feet of fine to coarse sand with some gravel and silt with trace amounts of brick and cinders.
- Sandy Silt: Underlying the sandy fill in this portion of the Site is a unit of sandy silt. It was observed at a depth of approximately 4 to 6 feet in nearby borings. Soil sampling terminated at a depth of 10 feet in one boring. The sandy silt layer was approximately 4 feet thick at a depth of approximately 8 feet in a second boring.
- Silt: Underlying the sandy silt layer is a transition to a dense, olive to grey glacial till, from a depth of approximately 8 to 19 feet. The second boring was terminated at a depth of 19 feet.

Depths to groundwater at MW112 and MW112A, during groundwater sampling events, ranged from 8 to 12 feet below ground surface, respectively. Based on the results of GEI's groundwater elevation survey throughout the Site and our observation of Site topography, groundwater flows to the east.

2.3 Release Description

The Property is located approximately 350 feet northeast of the 50 Tufts Street property. Chlorinated VOCs generally have not been detected in soil beyond the limits of the 50 Tufts Street property. In addition, chlorinated VOCs have not been detected above laboratory reporting limits in the five soil samples collected between 0 to 12 feet from borings MW112 and MW112A (Table 1), each located within 30 feet of the Property. Based on these analytical results and the anticipated depth of soil excavation during the building construction, it is unlikely that contaminated soil will be encountered.

Chlorinated VOCs have been detected in groundwater beyond the 50 Tufts Street property boundaries. Chlorinated VOCs have also been detected above Method 1 GW-2 standards in groundwater samples collected from MW112A, located approximately 30 feet east of the Property within Knowlton Street. Based on the anticipated depth of soil excavation during the building construction, it is unlikely that groundwater will be encountered. However, the concentrations of chlorinated VOCs in groundwater indicate the potential for vapor intrusion into the new building after it is constructed. Therefore, GEI recommends that a vapor barrier and a sub-slab ventilation piping network be incorporated into the building construction.

2.4 Surrounding Receptors

The area surrounding the Site includes residential and commercial properties. We have not identified any sensitive environmental receptors within 500 feet of the Site. The Site is not located within a MassDEP-approved Wellhead Protection Area (Zone II Area), MassDEP Interim Wellhead Protection Area, or potentially productive aquifer (PPA), and no public water supplies or private drinking water wells are located within 1 mile of the Site. There is one Protected Open Space Area within 500 feet of the Property (Capuano Center). The closest surface water bodies are the Mystic River, located approximately 1 mile northeast of the Property, and the Charles River, located approximately 1.7 miles south-southeast of the Property.

3. Ram Objectives, Plan, and Schedule (310 CMR 40.0444[1][c])

3.1 Objectives

The objective of this RAM Plan is to address the following:

- Construction of the proposed two-family residential building, including installation of a vapor barrier and piping network.
- Management of potentially contaminated soil that will be excavated during construction.

The RAM Plan has been developed to be protective of construction workers, surrounding receptors, and future occupants of the proposed building. In addition, the RAM Plan was developed so that future investigation and remediation associated with the Site will not be significantly impeded by construction of the proposed building (Section 7).

3.2 Project Description

Proposed site development includes construction of a two-family residential building. The soil excavation and building construction will be performed by Sterling Construction & Development LLC, the current property owner. The total area of disturbance will be approximately 1,200 square feet (ft^2). The building is expected to be constructed with a basement that is partially above grade. A vapor barrier and sub-slab ventilation piping network will be installed beneath the building foundation during construction. It is the intention of the developer that the construction will be managed to not intercept the water table. The seasonal high water table will be confirmed in the field prior to

foundation construction. Soil excavation to support the building construction is not expected to go beyond 6 feet below ground surface.

As discussed in Section 2.3, it is unlikely that contaminated soil will be encountered during the building construction. However, GEI will collect a soil sample of the excavated soil for disposal characterization purposes. The excavation is expected to be above the groundwater table; therefore, it is unlikely that dewatering will be necessary.

3.3 Planned RAM Activities

Planned RAM activities include the following:

- Soil excavation and disposal: Approximately 400 cubic yards (600 tons) of soil will be excavated at the Property to construct the building and install utilities. Because it is unlikely that contaminated soil will be encountered, we do not anticipate that excavated soil will be classified as remediation waste. However, GEI will collect a soil sample of the excavated soil at the beginning of the project for disposal characterization purposes.
- Soil handling: Most soil is likely to be loaded directly onto trucks and transported off-site for reuse, recycling, and/or disposal at an appropriate receiving facility. Some soil may be stockpiled on site for reuse as backfill. Soil will be characterized prior to off-site reuse, recycling, and/or disposal. Excavated material will be stockpiled separately as necessary based on the anticipated disposal location (based on characterization sampling) or based on field screening results. At a minimum, excavated material with visible stains or unnatural odor indicative of oil and hazardous materials (OHM) will be separated from material that does not exhibit these characteristics. Soil will be stockpiled on a 6-mil-thick, polyethylene barrier or other impervious surface, if necessary, and covered with a 6-mil-thick, polyethylene barrier in bermed areas where storm water runoff is diverted from the stockpile(s).
- Soil screening and additional characterization: We will periodically screen material on the Property. The screening will consist of visual and olfactory observations combined with jar-headspace testing for VOCs using a photoionization detector (PID). If we identify material during excavation as having characteristics inconsistent with those anticipated, the material will be stockpiled separately and further characterized.
- Groundwater management: Based on the anticipated depth of soil excavation during the building construction, and the depth to groundwater in the vicinity of the Property, it is unlikely that groundwater will be encountered. Therefore, we anticipate that dewatering will not be necessary to manage groundwater during construction activities.
- Vapor barrier and piping network installation: Based on the VOC concentrations in groundwater, vapor intrusion is a potential exposure pathway to future occupants of the planned building. Consequently, vapor intrusion mitigation measures are being undertaken. These measures consist of installation of a vapor barrier and piping network beneath the building foundation slab.

  The building will have a sub-slab piping network that could be retrofitted with a blower to operate as an active sub-slab depressurization system (SSDS), if necessary. During construction, appropriate electrical and telephone hookups also will be installed to provide connections to a radon-type fan and remote telemetric system if needed based on the results of post-construction confirmatory indoor air testing. The piping network will consist of 4-inch-diameter perforated polyvinyl chloride (PVC) piping embedded in 12 inches of washed stone. The perforated piping will be connected to a solid lateral pipe manifold and a solid riser pipe that will be routed through the building envelope, terminating above the roof line. The vapor barrier will be a 20-mil multilayer polyethylene and resin-based membrane using overlapping seams and pipe boots for pipe penetrations. Fig. 3 shows the proposed piping

network layout. Specifications for the piping network and vapor barrier are included in Appendix C.

We will perform one round of confirmatory indoor air testing following building construction to demonstrate that the vapor intrusion mitigation measures are effective, and confirm that compounds of concern (COCs) are not present in indoor air at concentrations that would not constitute a condition of No Significant Risk (NSR) to building occupants. If the initial confirmatory indoor air testing demonstrates that the vapor intrusion mitigation measures are effective, we will submit a RAM Completion Report. Additional rounds of confirmatory indoor air testing will be conducted in subsequent calendar quarters as part of Phase V activities for the 50 Tufts Street site.

3.4 Schedule

The RAM is expected to begin in December 2013 and be completed by April 2014.

4. Remediation Waste Management (310 CMR 40.0444[1][d])

4.1 Soil Excavation and Management

Approximately 400 cubic yards (600 tons) of soil will be excavated at the Property to construct the building and install utilities. Because it is unlikely that contaminated soil will be encountered, we do not anticipate that excavated soil will be classified as remediation waste.

GEI will collect a soil sample at the beginning of soil excavation for disposal characterization purposes. We will also periodically screen material on site. The screening will consist of visual and olfactory observations combined with jar-headspace testing for VOCs using a PID. If Site-related contamination is detected above applicable reportable concentrations (RCs), the soil will be managed as remediation waste in accordance with the MCP.

We anticipate that the soil will be not be classified as "Contaminated," based on soil characterization testing, and that it will be transported off site under a Material Shipping Record (MSR). If the soil characterization testing indicates that any soil is Remediation Waste, with concentrations of contaminants greater than RCS-1 and not subject to a notification exemption (listed at 310 CMR 40.0317), then that soil will be transported offsite under a Bill of Lading (BOL). RCS-1 Material will be transported off site under an MSR. Sterling Construction & Development LLC will sign all BOLs, MSRs, and/or manifests as the generator in accordance with 310 CMR 40.0034/0035.

Unless soil characterization testing demonstrates otherwise, we anticipate that soil will be disposed off-site in accordance with MassDEP Guidance "WSC-#13-500: Similar Soils Provision Guidance," October 2, 2013.

4.2 Groundwater Management

Based on the anticipated depth of soil excavation during the building construction and the depth to groundwater in the vicinity of the Property, it is unlikely that groundwater will be encountered during building construction. Therefore, it is unlikely that dewatering will be required.

5. Worker Protection and Environmental Monitoring (310 CMR 40.0444[1][e])

It is unlikely that contaminated soil or groundwater will be encountered during the project. If it is determined through field screening and laboratory analysis of site soil that workers could be exposed

to COCs, then the contractor will prepare and implement a project Health and Safety Plan (HASP) to protect workers at the Property from potentially contaminated material.

6. Permits (310 CMR 40.0444[1][f])

Sterling Construction & Development LLC will obtain the necessary building, mechanical, and electrical permits required by the City of Somerville. No other permits are required to perform the RAM.

7. Construction of Buildings in Contaminated Areas (MassDEP Policy WSC-00-425)

As part of the construction of buildings at a contaminated site, MassDEP Policy "WSC-00-425: Construction of Buildings in Contaminated Areas," dated January 2000, requires that the following must be included in RAM activities:

- A focused site characterization within and adjacent to the footprint of the proposed structures to adequately define the nature and degree of contamination.
- A focused risk assessment to adequately characterize the nature of risks to construction workers, surrounding populations, and future building occupants.
- A focused remedial program to eliminate unacceptable risks to construction workers, surrounding populations, and future building occupants.
- A focused feasibility study to evaluate the feasibility of cleaning up to background conditions. In addition, the building construction shall not prevent or impede likely future response actions.

7.1 Focused Site Characterization

Response actions have been ongoing at the Site, and the Site is currently in Phase V. Therefore, the nature and degree of contamination throughout the Site have been well characterized.

As discussed above, based on the soil analytical results associated with investigation locations MW112 and MW112A, the depth to groundwater in the vicinity of the Property, and the conceptual site model, we do not expect Site-related contamination to be encountered at the Property in soil or groundwater during the building construction. It is our opinion that existing data within the vicinity of the Property are adequate for the purposes of a focused site characterization.

7.2 Focused Risk Assessment

We do not expect Site-related contamination to be encountered during the building construction. Accordingly, construction activities will not pose an unacceptable risk to construction workers or surrounding populations. The installation of the sub-slab piping network and vapor barrier will mitigate the potential vapor intrusion pathway and protect future building occupants from exposure to Site-related contamination in indoor air. After construction is complete, testing will be conducted to confirm that COCs are not present in indoor air at concentrations that would not constitute a condition of NSR to building occupants. The planned Activity and Use Limitation (AUL) will require maintenance of the piping network, vapor barrier, and fan (if installation of a fan is warranted based on the results of confirmatory testing).

7.3 Focused Remedial Program

Exposure to Site-related contamination during the construction project is not expected, and the piping network and vapor barrier will mitigate the potential vapor intrusion pathway for future building occupants. Therefore, unacceptable risks to construction workers, surrounding populations, or future building occupants are not expected. In addition, if contaminated material is encountered, the contractor will prepare and implement a project HASP to protect workers at the Property.

7.4 Focused Feasibility Study

Exposure to Site-related contamination during the construction project is not expected. Accordingly, "Hot spots," as defined in the MCP, are not likely to be present at the Property.

In accordance with WSC-00-425, a focused feasibility study need not be prepared for sites where such concerns have been adequately addressed in a Phase II and/or Phase III report previously submitted to MassDEP. The Phase II / Phase III report for the Site was submitted to MassDEP in July 2008.

8. Limitations

This RAM Plan was prepared for the use of Sterling Construction & Development LLC and UniFirst. The conclusions presented in this report are based solely on the information contained or referenced in this report. Additional quantitative information regarding the Site that was not available to us may result in a modification of the findings above. The report has been prepared in accordance with generally accepted geohydrological practices. No warranty, expressed or implied, is made.

Please contact me at 781-721-4012 or igladstone@geiconsultants.com, if you have any questions.

Sincerely,

GEI CONSULTANTS, INC.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

JDR/ISG:csh
Enclosures
c: Richard Arnone, Sterling Construction & Development LLC
Timothy Cosgrave, UniFirst Corporation
N:\04516\19.0 Reports in Progress\19.32 34 Knowlton RAM Plan\34 Knowlton RAM Plan.docx

GEI Consultants

Geotechnical
Environmental
Water Resources
Ecological

Table 1
Chemical Testing Results - Subsurface Soil
50 Tufts Street
Somerville, Massachusetts

			Location Name:	MW112	MW112	MW112A	MW112A	MW112A
			Sample Name:	B112(6-7')	B112-VAC-COMP	B112-VAC-GRAB	B112A(0-3')	B112A(10-12')	B112A(17-19')
			Sample Depth (ft):	6 to 7	2 to 4	3	0 to 3	10 to 12	17 to 19
			Sample Date:	1/8/07	1/4/07	1/4/07	3/10/07	3/10/07	3/10/07
Analyte	**Method**	**Units**							
Volatile Organic Compounds (VOCs)									
Benzene	8260	mg/kg	< 0.028	NT	< 0.027	< 0.031	< 0.02	< 0.022
Butanone,2- (MEK)			< 0.28	NT	< 0.27	< 0.31	< 0.2	< 0.22
Dichloroethane,1,1-			< 0.11	NT	< 0.11	0.13 J	< 0.081	0.0265 J
Dichloroethene, cis-1,2-			< 0.11	NT	< 0.11	< 0.13	< 0.081	< 0.087
Ethylbenzene			< 0.11	NT	< 0.11	< 0.13	< 0.081	< 0.087
Methyl-2-pentanone,4- (MIBK)			< 0.28	NT	< 0.27	< 0.31	< 0.2	< 0.22
Methylene chloride			< 0.11	NT	< 0.11	< 0.13	< 0.081	< 0.087
Naphthalene			< 0.28	NT	< 0.27	< 0.31	< 0.2	< 0.22
Tetrachloroethene (PCE)			< 0.11	NT	0.11 F+	0.13 J	0.0471 J	1.04
Toluene			< 0.28	NT	< 0.27	< 0.31	< 0.2	< 0.22
Trichloroethane,1,1,1-			< 0.11	NT	< 0.11	< 0.13	< 0.081	< 0.087
Trichloroethene (TCE)			< 0.11	NT	< 0.11	< 0.13	< 0.081	0.138
Xylene, m,p-			< 0.11	NT	< 0.11	< 0.13	< 0.081	< 0.087
Xylene, o-			< 0.11	NT	< 0.11	< 0.13	< 0.081	< 0.087
Total Xylenes			< 0.11	NT	< 0.11	< 0.13	< 0.081	< 0.087
Volatile Petroleum Hydrocarbons (VPH)								
C5-C8 Aliphatics	MAVPH	mg/kg	NT	NT	NT	NT	NT	NT
Extractable Petroleum Hydrocarbons (EPH)								
C9-C18 Aliphatics	MAEPH	mg/kg	NT	NT	NT	NT	NT	NT
C11-C22 Aromatics	MAEPH	mg/kg	NT	NT	NT	NT	NT	NT
Other								
Solids, Percent	1603M	%	76.5	81.8	81.8	80.5	92	85.9
Specific Conductivity	E120.1	µmhos/cm	685	1980	NT	NT	NT	NT
Total Organic Carbon	9060	mg/kg	< 1300	4600	NT	NT	NT	NT
pH	9045	s.u.	7.2	6.8	NT	NT	NT	NT

General Notes:

1. "<" = The analyte was not detected at a concentration above the specified reporting limit.
2. mg/kg = milligrams per kilogram.
3. µmhos/cm = micro-ohms per centimeter.
4. s.u. = standard units.
5. NT = Not Tested

Qualifying Notes:

J The reported result is below the laboratory reporting limit and is estimated.
F+ The result has a high bias due to matrix spike recovery above upper contriol limits.

GEI Consultants

Geotechnical
Environmental
Water Resources
Ecological

This Image provided by MassGIS is from U.S.G.S.
Topographic 7.5 X 15 Minute Series
Boston North, MA Quadrangle, 1985.
Datum is National Geodetic Vertical Datum (NGVD).
Contour Interval is 3 Meters.

MASSACHUSETTS
QUADRANGLE LOCATION

Release Abatement Measure (RAM) Plan 50 Tufts Street Somerville, Massachusetts	GEI Consultants	SITE LOCATION MAP
UniFirst Corporation Wilmington, Massachusetts	Project 04516-3	December 2013 Fig. 1

N:\04516\#Drafting\04516-3\Phase V SR 4\045163 Ph V SR 4 Fig 1-1

LEGEND:

- MONITORING WELL WITH SOIL VAPOR SAMPLE PORT INSTALLED BY GEI, JANUARY 2007 - JANUARY 2008
- MONITORING WELL INSTALLED BY SANBORN HEAD ASSOCIATES, 2002
- MONITORING WELL INSTALLED BY GEOINSIGHT, JUNE 2004
- SOIL BORING ADVANCED BY GEOINSIGHT, AUGUST 2004
- MONITORING WELL INSTALLED BY GEI, MAY 2006
- DRIVEN POINT MONITORING WELL INSTALLED BY MADEP, MAY 2007
- MONITORING WELL INSTALLED PREVIOUSLY, DATE UNKNOWN
- PREVIOUSLY INSTALLED IRRIGATION WELL
- ▲ SOIL SAMPLE COLLECTED PRIOR TO MONITORING WELL INSTALLATION
- 84 STREET ADDRESS

MBTA = MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

- DISPOSAL SITE BOUNDARY (DASHED WHERE INFERRED)
- INFERRED EXTENT OF PCE CONCENTRATION IN SHALLOW GROUNDWATER GREATER THAN OR EQUAL TO 50 MICROGRAMS PER LITER (µg/l)
- PORTION OF SITE SUBJECT TO THE RAM PLAN

GENERAL NOTES:

1. HORIZONTAL CONTROL FOR THIS PLAN WAS ESTABLISHED BY GPS AND IS BASED ON THE NORTH AMERICAN DATUM OF 1983.
2. STREET AND PROPERTY LINES BASED ON SOMERVILLE ASSESSORS' MAPS AND ARE BEST FIT RELATIVE TO THE LOCATION OF THE 50 TUFTS ST. BUILDING.
3. MONITORING WELL LOCATIONS WERE ESTABLISHED BASED ON THE GROUND SURVEYS BY BSC GROUP, INC.

Release Abatement Measure (RAM) Plan
50 Tufts Street
Somerville, Massachusetts

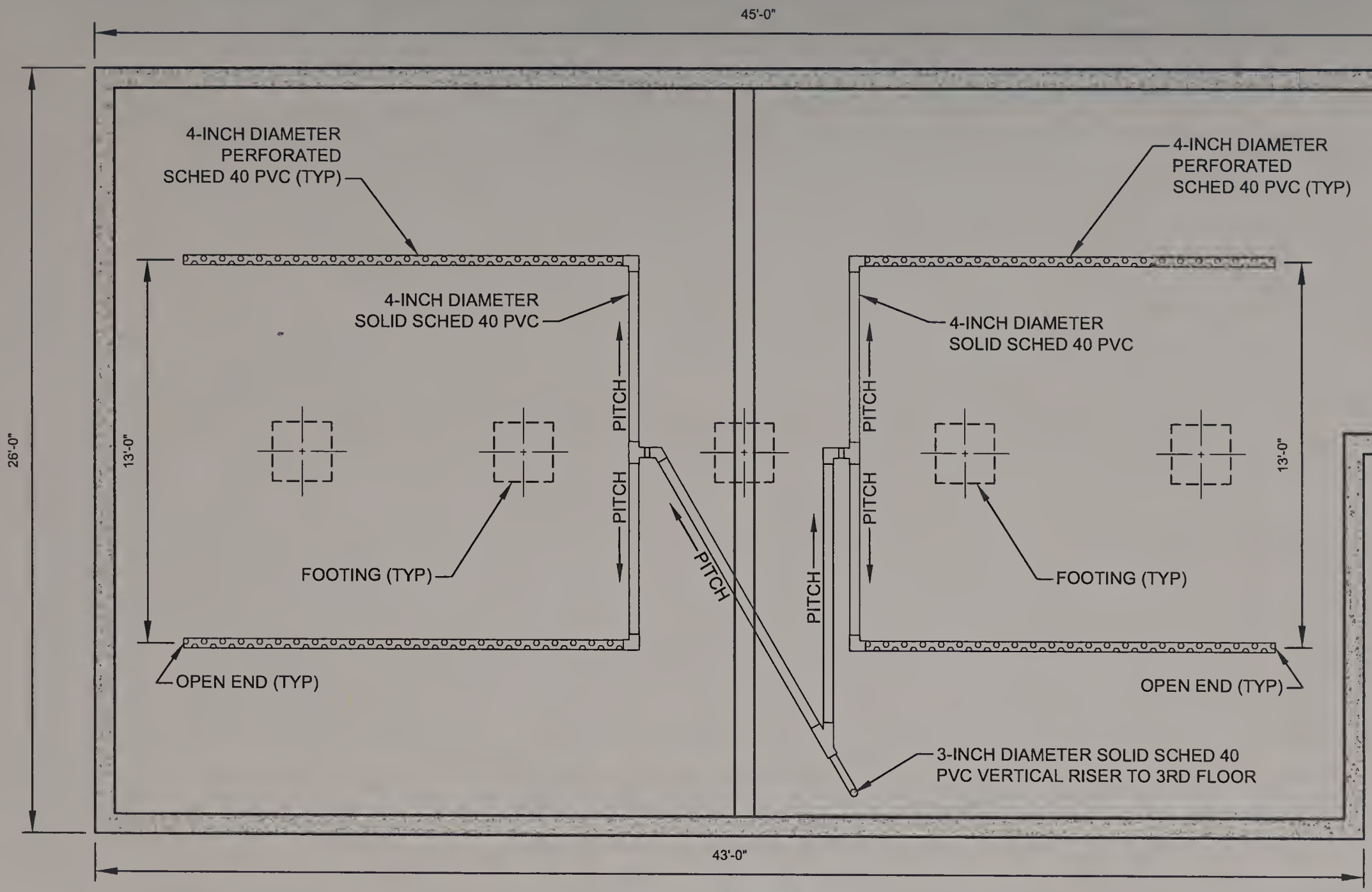
UniFirst Corporation
Wilmington, Massachusetts

GEI Consultants

34 KNOWLTON STREET - PORTION OF DISPOSAL SITE SUBJECT TO RAM PLAN

Project 04516-3 | December 2013 | Fig. 2

N:\04516\#Drafting\04516-3\Partial RAOs\Wave 1\0451603-31 34 Knowlton St



FULL BASEMENT

NOT TO SCALE

NOTES:

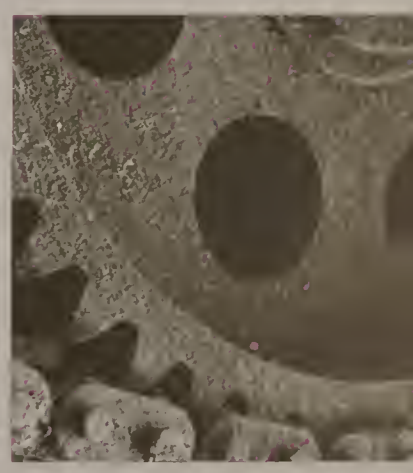
1. SOLID LATERAL PIPE CAN BE LOCATED PROXIMATE TO VERTICAL UTILITY

Release Abatement Measure (RAM) Plan 50 Tufts Street Somerville, Massachusetts	GEI Consultants	CONCEPTUAL VAPOR MITIGATION DESIGN 34 Knowlton Street
UniFirst Corporation Wilmington, Massachusetts	Project 04516-3	December 2013 Fig. 3

N:\04516\#Drafting\04516-3\Residential Vapor Mitigation\045163-RVM 34 Knowlton

GEI Consultants

Geotechnical
Environmental
Water Resources
Ecological



Appendix A

MassDEP Transmittal Form

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

Release Tracking Number: 3 - 23246

A. SITE LOCATION:

1. Site Name/Location Aid: 50 TUFTS ST & PROP ACROSS THE ST

2. Street Address: 50 TUFTS ST

3. City/Town: SOMERVILLE 4. ZIP Code: 02145-4129

5. UTM Coordinates: a. UTM N: 4694322 b. UTM E: 328049

☑ 6. Check here if a Tier Classification Submittal has been provided to DEP for this disposal site.

☐ a. Tier IA ☐ b. Tier IB ☑ c. Tier IC ☐ d. Tier II

7. If a Tier I Permit has been issued, provide Permit Number: W085813

B. THIS FORM IS BEING USED TO: (check all that apply)

1. List Submittal Date of Initial RAM Plan (if previously submitted): _____ (mm/dd/yyyy)

☑ 2. Submit an **Initial Release Abatement Measure (RAM) Plan**.

☑ a. Check here if the RAM is being conducted as part of the construction of a permanent structure. If checked, you must specify what type of permanent structure is to be erected in or in the immediate vicinity of the area where the RAM is to be conducted.

b. Specify type of permanent structure: (check all that apply) ☐ i. School ☑ ii. Residential ☐ iii. Commercial

☐ iv. Industrial ☐ v. Other Specify: _____

☐ 3. Submit a **Modified RAM Plan** of a previously submitted RAM Plan.

☐ 4. Submit a **RAM Status Report**.

☐ 5. Submit a **Remedial Monitoring Report**. (This report can only be submitted through eDEP, concurrent with a RAM Status Report.)

a. Type of Report: (check one) ☐ i. Initial Report ☐ ii. Interim Report ☐ iii. Final Report

b. Number of Remedial Systems and/or Monitoring Programs: _____

A separate BWSC106A, RAM Remedial Monitoring Report, must be filled out for each Remedial System and/or Monitoring Program addressed by this transmittal form.

☐ 6. Submit a **RAM Completion Statement**.

☐ 7. Submit a **Revised RAM Completion Statement**.

8. Provide Additional RTNs:

☐ a. Check here if this RAM Submittal covers additional Release Tracking Numbers (RTNs). RTNs that have been previously linked to a Primary Tier Classified RTN do not need to be listed here. This section is intended to allow a RAM to cover more than one unclassified RTN and not show permanent linkage to a Primary Tier Classified RTN.

b. Provide the additional Release Tracking Number(s) covered by this RAM Submittal. ☐ - _____ ☐ - _____

(All sections of this transmittal form must be filled out unless otherwise noted above)

C. RELEASE OR THREAT OF RELEASE CONDITIONS THAT WARRANT RAM:

1. Identify Media Impacted and Receptors Affected: (check all that apply)

☑ a. Air ☐ b. Basement ☐ c. Critical Exposure Pathway ☑ d. Groundwater ☑ e. Residence

☐ f. Paved Surface ☐ g. Private Well ☐ h. Public Water Supply ☐ i. School ☐ j. Sediments

☐ k. Soil ☐ l. Storm Drain ☐ m. Surface Water ☐ n. Unknown ☐ o. Wetland ☐ p. Zone 2

☐ q. Others Specify:

2. Identify all sources of the Release or Threat of Release, if known: (check all that apply)

☐ a. Above-ground Storage Tank (AST) ☐ b. Boat/Vessel ☑ c. Drums ☐ d. Fuel Tank

☑ e. Pipe/Hose/Line ☐ f. Tanker Truck ☐ g. Transformer ☐ h. Under-ground Storage Tank (UST)

☐ i. Vehicle ☐ j. Others Specify:

3. Identify Oils and Hazardous Materials Released: (check all that apply)

☐ a. Oils ☑ b. Chlorinated Solvents ☐ c. Heavy Metals

☐ d. Others Specify:

D. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply, for volumes list cumulative amounts)

☐ 1. Assessment and/or Monitoring Only
☐ 2. Temporary Covers or Caps
☐ 3. Deployment of Absorbent or Containment Materials
☐ 4. Temporary Water Supplies
☑ 5. Structure Venting System
☐ 6. Temporary Evacuation or Relocation of Residents
☐ 7. Product or NAPL Recovery
☐ 8. Fencing and Sign Posting
☐ 9. Groundwater Treatment Systems
☐ 10. Soil Vapor Extraction
☐ 11. Bioremediation
☐ 12. Air Sparging

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Release Tracking Number: 3 - 23246

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

D. DESCRIPTION OF RESPONSE ACTIONS (cont.): (check all that apply, for volumes list cumulative amounts)

☑ 13. Excavation of Contaminated Soils

☑ a. Re-use, Recycling or Treatment ☐ i. On Site Estimated volume in cubic yards

☑ ii. Off Site Estimated volume in cubic yards: 400

iia. Receiving Facility: TBD Town: TBD State: MA

iib. Receiving Facility: Town: State:

iii. Describe:

☐ b. Store ☐ i. On Site Estimated volume in cubic yards

☐ ii. Off Site Estimated volume in cubic yards

iia. Receiving Facility: Town: State:

iib. Receiving Facility: Town: State:

☐ c. Landfill

☐ i. Cover Estimated volume in cubic yards

Receiving Facility: Town: State:

☐ ii. Disposal Estimated volume in cubic yards

Receiving Facility: Town: State:

☐ 14. Removal of Drums, Tanks or Containers

a. Describe Quantity and Amount:

b. Receiving Facility: Town: State:

c. Receiving Facility: Town: State:

☐ 15. Removal of Other Contaminated Media

a. Specify Type and Volume:

b. Receiving Facility: Town: State:

c. Receiving Facility: Town: State:

☐ 16. Other Response Actions:

Describe:

☐ 17. Use of Innovative Technologies:

Describe:

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

Release Tracking Number: 3 - 23246

E. LSP SIGNATURE AND STAMP :

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR 4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> *if Section B of this form indicates that a* ***Release Abatement Measure Plan*** *is being submitted*, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B of this form indicates that a* ***Release Abatement Measure Status Report*** *and/or* ***Remedial Monitoring Report*** *is being submitted*, the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B of this form indicates that a* ***Release Abatement Measure Completion Statement*** *is being submitted*, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000 and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal:

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP #: 9719
2. First Name: ILEEN S
3. Last Name: GLADSTONE
4. Telephone: (781) 721-4012
5. Ext.:
6. FAX:
7. Signature: ILEEN S GLADSTONE
8. Date: 12/5/2013 (mm/dd/yyyy)
9. LSP Stamp:

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

Release Tracking Number: 3 - 23246

F. PERSON UNDERTAKING RAM:

1. Check all that apply: ☐ a. change in contact name ☐ b. change of address ☑ c. change in the person undertaking response actions

2. Name of Organization: STERLING CONSTRUCTION & DEVELOPMENT LLC

3. Contact First Name: RICHARD 4. Last Name: ARNONE

5. Street: 285 COMMANDANTS WAY, SUITE 12 6. Title: MANAGER

7. City/Town: CHELSEA 8. State: MA 9. ZIP Code: 02150-0000

10. Telephone: (781) 953-7112 11. Ext.: 12. FAX: (617) 884-7745

G. RELATIONSHIP TO RELEASE OR THREAT OF RELEASE OF PERSON UNDERTAKING RAM:

☑ 1. RP or PRP ☑ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter

☐ e. Other RP or PRP Specify:

☐ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ 4. Any Other Person Undertaking RAM Specify Relationship:

H. REQUIRED ATTACHMENT AND SUBMITTALS:

☐ 1. Check here if any Remediation Waste, generated as a result of this RAM, will be stored, treated, managed, recycled or reused at the site following submission of the RAM Completion Statement. You must submit a Phase IV Remedy Implementation Plan along with the appropriate transmittal form (BWSC108).

☐ 2. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

☑ 3. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the implementation of a Release Abatement Measure.

☐ 4. Check here if any non-updatable information provided on this form is incorrect, e.g. Release Address/Location Aid. Send corrections to the DEP Regional Office.

☐ 5. If a RAM Compliance Fee is required for this RAM, check here to certify that a RAM Compliance Fee was submitted to DEP, P. O. Box 4062, Boston, MA 02211.

☑ 6. Check here to certify that the LSP Opinion containing the material facts, data, and other information is attached.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC106

RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM

Release Tracking Number
3 - 23246

Pursuant to 310 CMR 40.0444 - 0446 (Subpart D)

I. CERTIFICATION OF PERSON UNDERTAKING RAM:

1. I, **RICHARD ARNONE** , attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

2. By: **RICHARD ARNONE** 3. Title: **MANAGER**

Signature

4. For: **STERLING CONSTRUCTION & DEVELOPMENT LLC** 5. Date: **12/5/2013**

(Name of person or entity recorded in Section F) (mm/dd/yyyy)

☐ 6. Check here if the address of the person providing certification is different from address recorded in Section F.

7. Street:

8. City/Town: 9. State: 10. ZIP Code:

11. Telephone: 12. Ext.: 13. FAX:

YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO $10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

Date Stamp (DEP USE ONLY:)

Received by DEP on

12/5/2013 9:49:10 AM

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Transaction Overview Trans# 614341 ID# 3-23246 BWSC106 Release Abatement Measure Transmittal Form

Forms Attach Files Signature Receipt

Summary & Receipt

Print Receipt Exit

Your submission is complete. Thank you for using eDEP's online reporting system. Select My eDEP to see a list of your transactions. Click Print Receipt to save a copy of this receipt for your records.

DEP Transaction ID: 614341
Date and Time Submitted: 12/5/2013 9:49:10 AM
Other Email :

Form Name: BWSC106 Release Abatement Measure Transmittal Form

RTN: 3-23246
Location: 50 TUFTS ST & PROP ACROSS THE ST
Address: 50 TUFTS ST, SOMERVILLE, 021454129

Person Making Submittal
STERLING CONSTRUCTION & DEVELOPMENT LLC
RICHARD ARNONE
285 COMMANDANTS WAY, SUITE 12
CHELSEA, MA 021500000

LSP
LSP #: 9719
LSP Name: ILEEN S GLADSTONE

Person Making Certification
STERLING CONSTRUCTION & DEVELOPMENT LLC
Richard Arnone
STERLING CONSTRUCTION & DEVELOPMENT LLC
Richard Arnone

Ancillary Document Uploaded/Mailed
BWSC-106 Sec.B Q.2 - RAM Plan - Uploaded (34 Knowlton RAM Plan.pdf)

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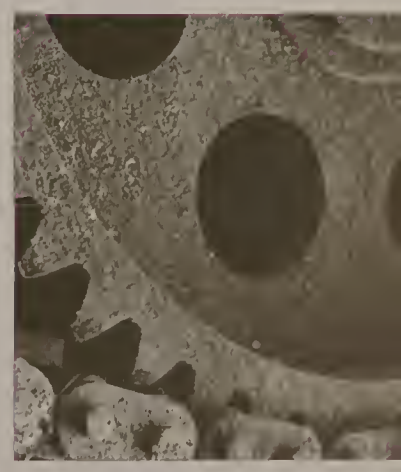
GEI Consultants

Geotechnical
Environmental
Water Resources
Ecological



Appendix B

Public Notice Letters

December 4, 2013
Project 04516-3

Mayor Joseph A. Curtatone
Somerville City Hall
93 Highland Avenue
Somerville, MA 02143-1740

Dear Mayor Curtatone:

Re: Release Abatement Measure Plan
34 Knowlton Street
Somerville, Massachusetts
MassDEP RTN 3-23246

On behalf of Sterling Construction & Development LLC of Chelsea, Massachusetts, GEI Consultants, Inc. is notifying your office that a Release Abatement Measure (RAM) Plan has been prepared for the portion of the 50 Tufts Street disposal site identified as 34 Knowlton Street in Somerville, Massachusetts.

The work includes installation of a vapor barrier and a sub-slab ventilation piping network, and management of potentially contaminated soil, during construction of a proposed two-family residential building at 34 Knowlton Street in Somerville, Massachusetts. The work associated with the RAM is expected to begin after December 2, 2011 and be completed by April 2014.

The RAM Plan is on file with the Massachusetts Department of Environmental Protection (MassDEP), Northeast Regional Office in Wilmington, Massachusetts.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

JDR/ISG:csh
c: Richard Arnone, Sterling Construction & Development LLC
Timothy Cosgrave, UniFirst Corporation
Vithal V. Deshpande, City of Somerville

GEI Consultants, Inc.
400 Unicorn Park Drive, Woburn, MA 01801
781 721.4000 fax: 781 721 4073

December 4, 2013
Project 04516-3

Ms. Paulette Renault-Caragianes
Director, Health Department
City Hall Annex
50 Evergreen Avenue
Somerville, MA 02145-2819

Dear Ms. Renault-Caragianes:

Re: Release Abatement Measure Plan
34 Knowlton Street
Somerville, Massachusetts
MassDEP RTN 3-23246

On behalf of Sterling Construction & Development LLC of Chelsea, Massachusetts, GEI Consultants, Inc. is notifying your office that a Release Abatement Measure (RAM) Plan has been prepared for the portion of the 50 Tufts Street disposal site identified as 34 Knowlton Street in Somerville, Massachusetts.

The work includes installation of a vapor barrier and a sub-slab ventilation piping network, and management of potentially contaminated soil, during construction of a proposed two-family residential building at 34 Knowlton Street in Somerville, Massachusetts. The work associated with the RAM is expected to begin after December 2, 2011 and be completed by April 2014.

The RAM Plan is on file with the Massachusetts Department of Environmental Protection (MassDEP), Northeast Regional Office in Wilmington, Massachusetts.

If you have any questions, please do not hesitate to contact me at 781-721-4012 or igladstone@geiconsultants.com.

Sincerely,

GEI CONSULTANTS, INC.

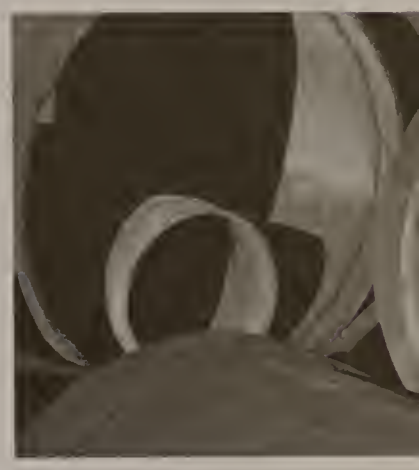
Ileen S. Gladstone, P.E., LSP, LEED AP
Vice President

JDR/ISG:csh
c: Richard Arnone, Sterling Construction & Development LLC
Timothy Cosgrave, UniFirst Corporation
Vithal V. Deshpande, City of Somerville

GEI Consultants, Inc.
400 Unicorn Park Drive, Woburn, MA 01801
781.721.4000 fax: 781 721.4073

GEI Consultants

Geotechnical
Environmental
Water Resources
Ecological



Appendix C

Sub-slab Venting Piping and Vapor Barrier Specifications

SUB SLAB VENTILATION PIPING

PART 1 – GENERAL

DESCRIPTION

This Section specifies general requirements for installation of sub slab ventilation piping to mitigate vapor intrusion from volatile organic compounds (VOCs) in the subsurface.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Ventilation Piping
1. 4-inch perforated schedule 40 Polyvinyl Chloride (PVC) piping.
2. 4-inch solid schedule 40 PVC pipe fittings.
3. Low VOC PVC cement and primer.

B. Pea Stone
1. Pea Stone shall be screened gravel and shall consist of durable, inert rounded stone, free of loam or clay, surface coatings, and deleterious materials. The gradation of Pea Stone shall be as follows:

Sieve Size Percent Passing by Weight
½ inch 100
3/8 inch 85 - 100
No. 4 10 - 30
No. 8 0 - 10
No. 16 0 - 5

PART 3 – EXECUTION

3.1 GENERAL

A. Furnish and install all appropriate materials to complete the Work.

B. Comply with all rules, regulations, laws, and ordinances of the Commonwealth of Massachusetts, and of all other authorities having jurisdiction.

C. Install sub slab ventilation piping in a manner that will not result in interference with other work or damage to adjacent properties, pavements and other surfaces, buildings, structures, utilities, and the environment.

D. Coordinate all penetrations through the foundation walls, footings, and slabs with the Structural Engineer.

3.2 LAYOUT AND CONNECTIONS

A. Each piece shall be laid true to line and grade to allow for pipe coupling.

B. Embed pipe in at least six inches of Pea Stone.

C. Remove large stones or other hard matter which could damage system piping or impede consistent backfilling or compaction.

D. Keep interior of pipe free of dirt and debris at all times.

E. Use solid protective sleeves for penetrations through foundation walls, footings, and slabs.

E. Weld all PVC joint connections using primer and cement.

F. Pitch horizontal piping runs towards the subsurface at a minimum slope of 1%.

G. Lay out system to piping footprint indicated on Drawings.

H. Do not displace or damage pipe when compacting.

End of Section

SUB SLAB VAPOR BARRIER

PART 1 – GENERAL

DESCRIPTION

This Section specifies general requirements for installation of a vapor barrier to mitigate vapor intrusion from volatile organic compounds (VOCs) in the subsurface.

PART 2 – PRODUCTS

2.1 UNDER SLAB GAS BARRIER

A. Gas Barrier: Specified Product: To establish a standard of quality, design and function desired, Drawings and specifications have been based on Reef Industries Inc., Houston TX., product "VaporBlock® Plus™ 20", 20 mil thickness, or approved equal.

1. Gas Barrier / Vapor Retarder must have the following qualities
2. ASTM E-1745 Standard for Plastic Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs
    a. Must meet all Class "A" criteria.
3. ASTM D 1434 Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting
    a. Methane Permeability: < 5 x 10-10 $m^2/d \cdot atm$
    b. Radon Diffusion Coefficient: < 0.25 x 10-12 m^2/s

2.2 ACCESSORIES

A. Seam Tape:

1. High Density Polyethylene Tape or HDPE Tape as recommended by gas barrier manufacturer, with pressure sensitive adhesive. Minimum width 6 inches.
2. Butyl Seal Tape: 2" wide double-sided reinforced butyl rubber tape, as recommended by gas barrier manufacturer

B. Pipe Boots: Construct pipe boots from vapor barrier material and pressure sensitive tape per manufacturer's instructions.

PART 3 - EXECUTION

3.1 PREPARATION

A. Level and tamp or roll aggregate, sand or tamped earth base.

3.2 INSTALLATION

A. General: Install gas barrier in accordance with manufacturer's instructions and ASTM E 1643. Place gas barrier beneath all floor slabs-on-grade, beneath buildings, including garage and service areas.

B. Unroll gas barrier with the longest dimension parallel with the direction of the pour.

C. Lap gas barrier over footings and seal to vertical foundation walls with double sided butyl seal tape.

D. Overlap joints a minimum of 12 inches and seal in-between overlap with 2-sided butyl seal tape then seal overlap with 4 inch wide barrier tape approved by gas barrier / vapor retarder manufacturer.

E. Seal all penetrations (including pipes, reinforcing steel, columns, and permanent utilities) with manufacturer's pipe boot or vapor barriers recommended detail. Install in manner to create a monolithic membrane between the surface of the slab and moisture sources below as well as at the slab perimeter.

F. Do not puncture gas barrier. No punctures or unsealed penetrations are permitted.

G. Repair damaged areas by cutting patches of gas barrier, overlapping damaged area 6 inches and taping all four sides with tape.

H. Perform smoke testing of vapor barrier by an experienced vapor barrier installation contractor. Repair any holes as described in 3.2 G.

End of Section

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